

Bellwork: 3/6/13

Graph the following:

$$-x(x-5)(x+1)(x-2)(x+1)$$

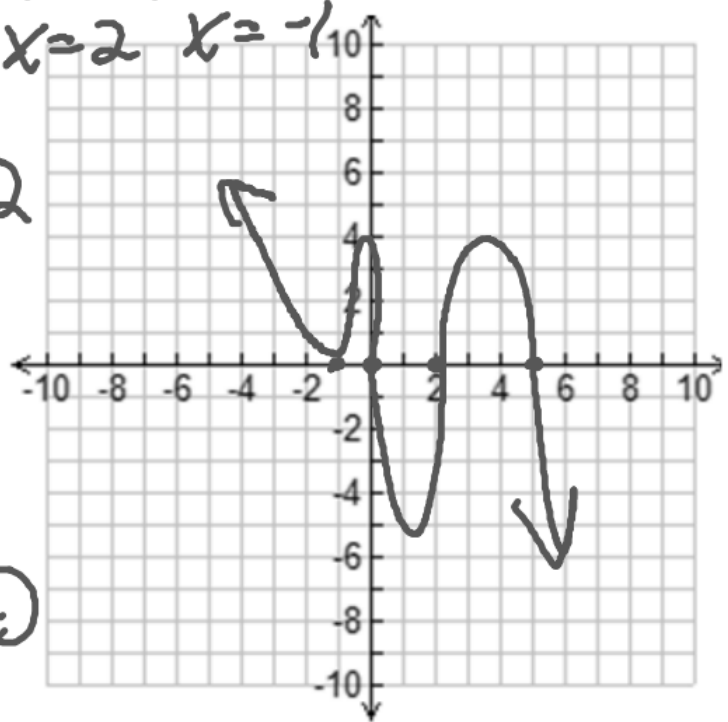
$$x=0 \quad x=5 \quad x=-1 \quad x=2 \quad x=-1$$

zeros: 0, 5, -1, -1, 2

y-int: (0, 0)

End Beh:

$$-x^5 = \text{odd} \ominus$$



Put each polynomial in standard form. Then determine the degree, number of terms, end behavior and number of u-turns (humps).

1) $y = -9x^2(2x + 4x^3 - 9x^2)$

Stand. Form: _____

Degree: _____ Terms: _____

End. Beh: _____ U-turns: _____

2) $y = (3x^2 - 7)(x^2 + 2)$

Stand. Form: _____

Degree: _____ Terms: _____

End. Beh: _____ U-turns: _____

Solve each of the following polynomials.

3) $x^4 - 8x^3 + 12x^2 = 0$

$$2x(2x+1)(3x-4)$$

$$2x=0 \quad 2x+1=0 \quad 3x-4=0$$

$$x=0 \quad x=-\frac{1}{2} \quad x=\frac{4}{3}$$

Roots: _____

4) $12x^3 = 10x^2 + 8x$

$$12x^3 - 10x^2 - 8x = 0$$

$$2x(6x^2 - 5x - 4) = 0$$

$$(6x^2 - 8x)(3x - 4)$$

$$2x(3x-4) + 1(3x-4)$$

Roots: $0, -\frac{1}{2}, \frac{4}{3}$

Find the polynomial function, in standard form, given the following roots:

5) $x = 0, 4, -7$

6) $x = -2, -1, 8$

Polynomial: _____

Polynomial: _____

7) $x = 0, 0, 4, -5$

8) $x = 2, -2, 5$

Polynomial: _____

Polynomial: _____

Graph each of the polynomial functions. Be sure to fill in all of the requested information.

9) $y = -2x^3 + 8x^2 - 8x$

$-2x(x^2 - 4x + 4)$

$-2x(x - 2)(x - 2)$

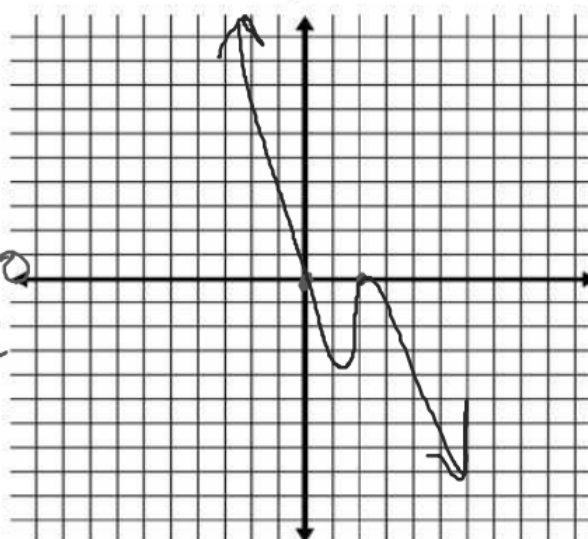
$-2x = 0 \quad x - 2 = 0 \quad x - 2 = 0$
 $x = 0 \quad x = 2 \quad x = 2$

Zeros: 0, 2, 2

y-int: (0, 0)

End Behavior: ↑ ↓

odd \ominus



10) $f(x) = x^3 - 7x^2 + 14x - 8$

Maximum # of roots: _____

Possible rational roots: _____

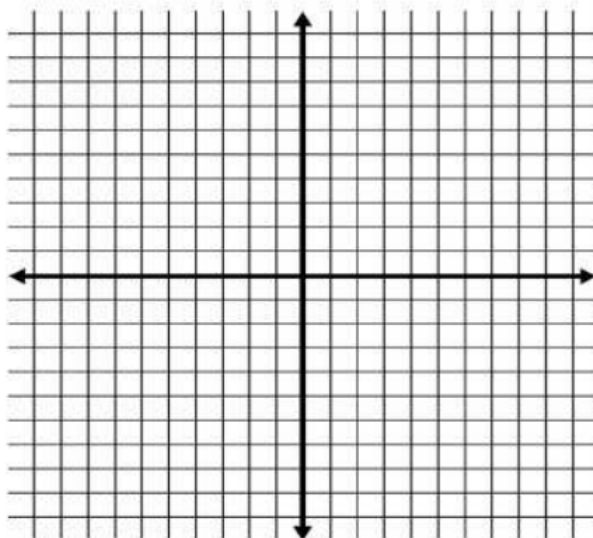
Factored form: _____

Actual roots: _____

y-intercept = _____

EB: _____ left, _____ right.

Workspace:



$$\begin{array}{r|rrrrr} -2 & 1 & -4 & -13 & 4 & 12 \\ + & & -2 & 12 & 2 & -12 \\ \hline & 1 & -6 & -1 & 6 & 0 \end{array}$$

11) $f(x) = x^4 - 4x^3 - 13x^2 + 4x + 12$

Maximum # of roots: 4

Possible rational roots: $\pm 1, 2, 3, 4, 6, 12$

Factored form: $(x+2)(x+1)(x-6)(x-1)$

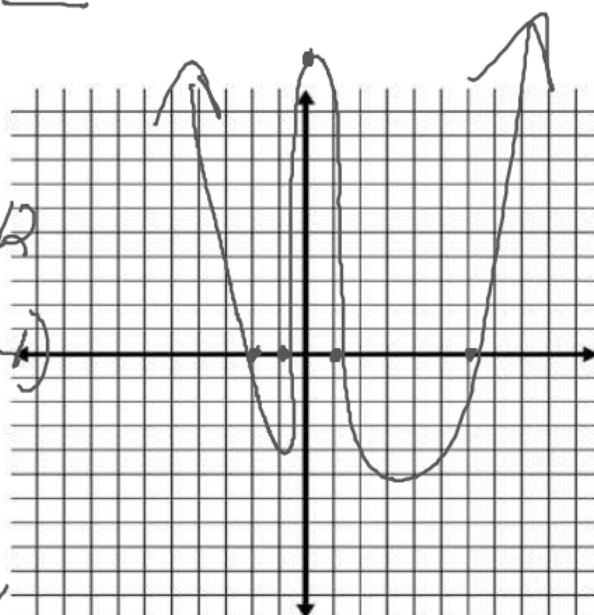
Actual roots: $-2, -1, 6, 1$

y-intercept = $(0, 12)$

EB: up left, up right.

Workspace:

$$\begin{array}{r|rrrr} 1 & 1 & -4 & -13 & 4 & 12 \\ + & & -2 & 12 & 2 & -12 \\ \hline & 1 & -6 & -1 & 6 & 0 \end{array}$$



$$\begin{array}{l} x^2 - 7x + 6 \\ (x-6)(x-1) \end{array}$$

12) $f(x) = 2x^4 - 11x^3 - 6x^2 + 64x + 32$

Maximum # of roots: _____

Possible rational roots: _____

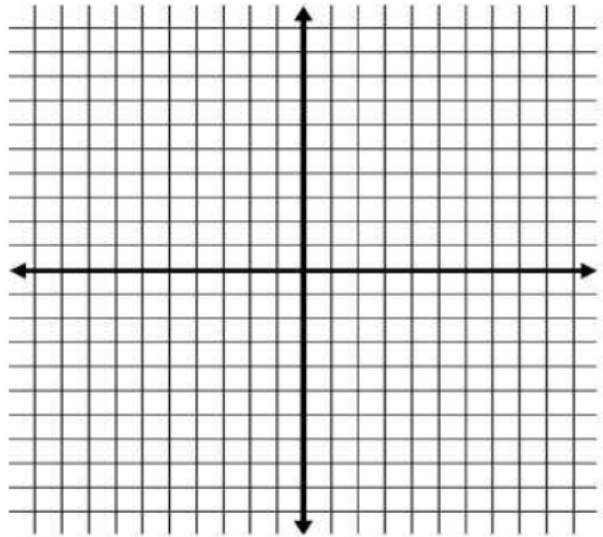
Factored form: _____

Actual roots: _____

y-intercept = _____

EB: _____ left, _____ right.

Workspace:



13) $f(x) = x^3 - 12x + 16$

Maximum # of roots: _____

Possible rational roots: _____

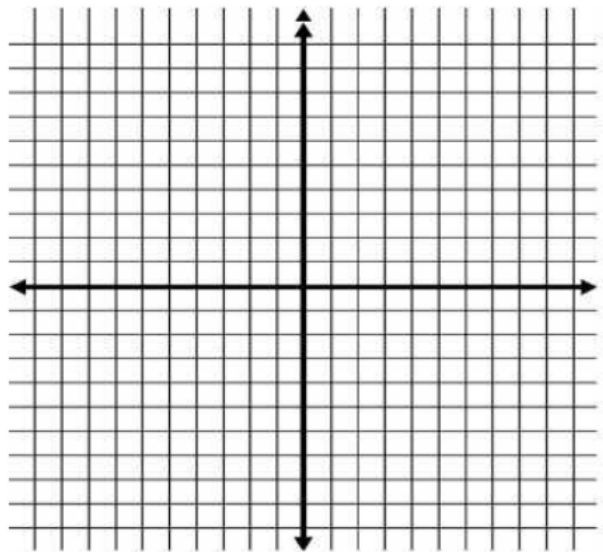
Factored form: _____

Actual roots: _____

y-intercept = _____

EB: _____ left, _____ right.

Workspace:



Find the requested information:

14) One factor of $f(x) = 4x^3 + 28x^2 - 9x - 63$ is $(x+7)$. What are the other two **factors**?

Factors: _____

15) The function $f(x) = x^3 - 3x^2 - 28x + 60$ has three x-intercepts. One of the intercepts occurs at $x = -5$. What are the other two **x-intercepts**?

$$\begin{array}{r} -5 \overline{) 1 \ -3 \ -28 \ 60} \\ \underline{+ 5 \ 40 \ -60} \\ 1 \ -8 \ 12 \ 0 \end{array}$$

$$x^2 - 8x + 12$$

$$(x-6)(x-2)$$

x-intercepts: $x=6, 2$

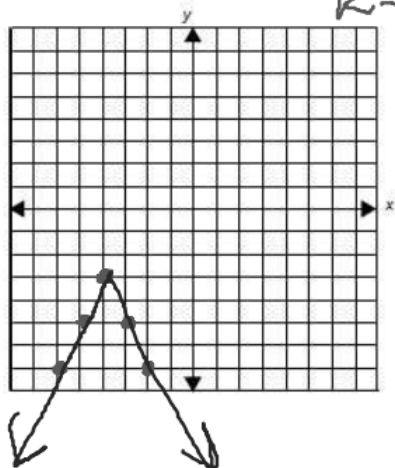
Cumulative Questions:

Graph the following functions using the grids below.

16)

$$y = -2|x + 4| - 3$$

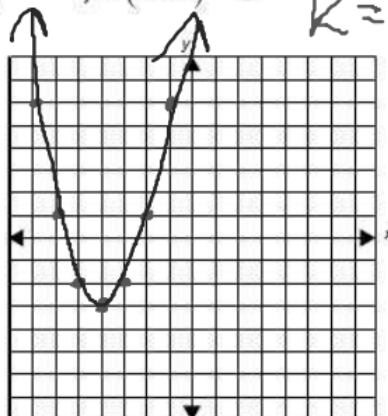
$$\begin{aligned} a &= -2 \\ h &= -4 \\ k &= -3 \end{aligned}$$



17)

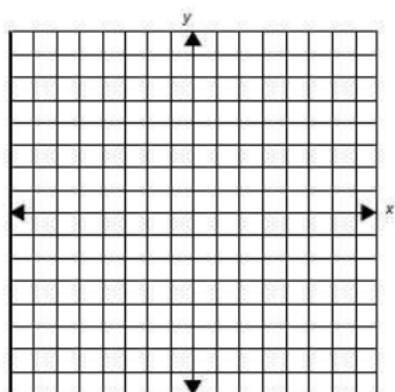
$$y = (x + 4)^2 - 3$$

$$\begin{aligned} a &= 1 \\ h &= -4 \\ k &= -3 \end{aligned}$$



18)

$$y = 3|x - 1| - 6$$



19)

$$y = -\frac{1}{2}(x + 6)^2 + 4$$

